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Works Council 'Disaffection' and Establishment Survivability†

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Abstract

This paper investigates the association between a measure of works council heterogeneity and plant closings in Germany, 2006-2015. Two datasets are used to identify failed establishments, while institutional heterogeneity is captured by management perceptions of the role of the works council in managerial decision making and also by allowing for works council learning. The potential moderating role of sectoral collective bargaining is also examined. We report that works councils per se are not associated with plant closure. Rather, it is establishments with disaffected councils that display higher rates of closure. The latter result does not obtain where such establishments are covered by sectoral agreements; an outcome that is consistent with the literature on the mitigation of rent-seeking behavior, and one that also receives support from our finding that plants with dissonant councils are more likely than their consensual counterparts to transition into sectoral bargaining coverage. On the other hand, there is only limited evidence of works council learning.

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1. Introduction

In this examination of the association between works councils and plant closings we revisit a neglected topic in the growing empirical literature on the effects of worker representation on firm performance. The topic is important for several reasons. Firstly, results on plant closure should help inform the empirical literature on the effect of worker representation on firm performance, the thrust of which may still be termed broadly negative for the U.S. but altogether more positive for other nations, most notably Germany which is the country setting of the present paper.[1] Secondly, and more narrowly, because in the absence of such information a particular performance study based on what turns out to be a population of long-run survivors might impart upward bias to positive estimates of the worker representation effect, or the converse in situations where worker representation is encouraged by poor firm performance.

In the present study we seek to gauge the effect of the German works councils on plant closings. Despite its pedigree, as is the case for other measures of worker representation, it has proven difficult to allow for the heterogeneity of the works council. Consequently, estimates of the impact of works councils on establishment closings have typically taken the institution to be homogeneous, even if allowing for institutional realities or moderating factors such as establishment size and collective bargaining regime, which factors assume importance in the German case because of the legal basis of the dual system (see Section 3).

In the present treatment, we exploit a key, albeit one-time question in the leading German establishment survey – the IAB Establishment Panel – to capture works council heterogeneity more directly. Specifically, we employ question 85 of the 2006 Establishment Panel which asks the management respondent: *how would you describe the role of the works council in management decision making in your establishment?* We use the three answers to this question, formally presented in Section 2, to differentiate between oppositional and cooperative councils. We choose to refer to the former as *disaffected* or *dissonant* works councils. The term(s) describe(s) those circumstances in which, in the opinion of management, company decisions have usually to be taken in the face of opposition from the works council. The default is consensus, namely situations where the position taken by the works council either ultimately or from the outset accords with that of management. It is hypothesized that difficult works councils elevate the bargaining problem and threaten plant survivability. It is further hypothesized that management may seek sectoral agreement coverage as a defensive response. The latter strategy can be thought of as a means of imposing discipline and rendering such works councils less prone to engage in rent-seeking behavior, with the ultimate goal of encouraging integrative bargaining on the lines envisaged by the collective voice model (Freeman and Lazear, 1995). We note at the outset that it would be preferable to construct a measure of *mutual disaffection* after Addison and Teixeira (2020), who use the Management and Employee Representative Questionnaires of the European Company Survey. Unfortunately, a unilateral measure is all that is available in the case of the IAB Establishment Panel.

Our analysis is carried out using a unique, state-of-the-art dataset on plant closings for the extended interval 2006-2015. Over this period, we observe both works council and non-works council establishments, albeit over varying spells. The type of works council, in particular, can be identified as disaffected or dissonant (as opposed to being cooperative) in the year 2006 alone. This identification is not optimal. Thus, for example, having only a cross section of data on the dissonance-cooperation question raises an obvious issue of causality as a non-dissonant council in 2006 may subsequently become dissonant for reasons that might include incompetent management. For its part, issues concerning works council age are addressed by constructing a rolling window of time – anchored in each case to the year 2006 – along which the age of the workplace representation entity will necessarily increase as the window widens. This construction allows us to introduce in part a dynamic dimension to dissonance in the full model setting. In particular, we can examine the argument that the dialogue between dissonant works councils and management may improve through time, albeit still subject to the caveat entered earlier on causality.

The plan of the paper is as follows. In Section 2 the extant literature on works councils and plant closings is first reviewed against the backdrop of the broader German literature with a direct bearing on the heterogeneity issue. A short primer on works councils in Section 3 provides added detail on the institution itself. Section 4 outlines our modeling strategy and set of specific hypotheses. The two data sets used in this inquiry – namely the IAB Establishment Panel/*Betriebspanel* and the Establishment History Panel/*Betriebs-Historik-Panel* – are described in Section 5. Section 6 presents our empirical findings. Finally, the discussion in Section 7 provides an overview and offers some recommendations for future work in this area.

2. Literature Review

Research into the association between works councils and plant closings in Germany is the neglected stepchild in what is now a burgeoning literature on works councils and firm performance. The closings issue has been of somewhat greater interest in Britain and the United States where unions are the main vehicle of formal workplace representation and where negative union effects on firm performance have more often been reported for the latter country and, in earlier times (i.e. before the 1990s), for the former nation as well. The corollary is that works councils have in general enjoyed a more favorable press than unions per se on both theoretical and empirical grounds and their association with plant closings may have attracted less attention as a result. Be that as it may, neither the British nor the U.S. research on plant closings has uncovered a clear link between unions and plant closings. British studies either report that union recognition and the union wage differential are statistically insignificant correlates of plant closings (respectively, Machin, 1995; Stewart, 1995) or that any well-determined positive association between unionism and plant closings is either partial (being driven by plants that are part of multi-establishment undertakings) or largely attributable to union decline/weakness (respectively, Addison et al., 2003; Bryson, 2004). Although U.S. findings

are somewhat mixed (cf. Dunne and Macpherson, 1994; Freeman and Kleiner, 1999), any general presumption that unions push firms over the edge is also contraindicated for that nation as well.[2]

Neither of the two extant German studies on plant closings to which we now turn invokes council disaffection, although as we shall see German research into other aspects of firm performance has paid attention to the tenor of the relationship between the works council and management. Interestingly, in view of the favorable theoretical light in which German works councils tend to be viewed – as the exemplar of collective voice – each study uncovers some contrary evidence in this regard. In the first such study, Addison et al. (2004) investigate plant closings using data from five waves (1996-2000) of the nationally representative IAB Establishment Panel (*Betriebspanel*) of the Institute for Employment Research (*Institut für Arbeitsmarkt- und Berufsforschung* – IAB). Probit estimates of the effects of works councils (and coverage by sectoral collective agreements) on plant closings are first run for all plants, using both pooled data for 1996-2000 and for an estimation linking plant closings over the whole sample period to establishment and economic conditions obtaining at the start of that period. In both cases the coefficient estimates for the works council dummy were significantly positive at the 0.01 level. This positive association between works council presence and closings persists across samples of covered and uncovered sectors and across establishments with either fewer or more than 50 employees. Only when separate regressions were run by coverage and establishment size were material differences in works council impact detected, works councils being now associated with distinctly elevated closings in uncovered smaller establishments.

In the only other study of the association between works councils and plant closings, Jirjahn (2011) used data from manufacturing establishments in Lower Saxony from the four-wave Hanover Firm Panel (*Hannoveraner Firmenpanel*, 1994-97). Jirjahn invokes the general point that works councils may play a positive role in establishment survival by virtue of their unique voice function, while recognizing that in practice any such pro-active effect may be negated by rent seeking behavior facilitated by the bargaining power conveyed by their codetermination rights (see section 3).[3] More concretely, the direction of the impact of works councils on plant closings is said to depend on interactions with the moderating factors of *ownership type* (specifically, a single independent establishment dummy) and sectoral collective bargaining coverage, along with the economic situation. Jirjahn first examines the determinants of plant closings using an all-establishment sample. His probit regression estimates yield insignificant coefficient estimates for works council presence, collective agreement coverage, and type of ownership. He then estimates separate plant closing regressions for single independent and multi-establishment firms. For single establishment plants, the presence of a works council is on average associated with a 10 percentage point higher probability of closure if the establishment is uncovered; with coverage, there is no significant association between works councils and closures. For multi-establishment plants, the direct works council 'effect' is negative and statistically significant, and there is no evidence to suggest that collective bargaining has a moderating influence. Jirjahn (2011: 23) surmises that works councils "play their intended role" (of voice) in

multi-establishment firms where the discipline offered by collective bargaining is secondary to that exerted by a firm-wide network of works councils, whereas in single establishment firms collective bargaining may both strengthen the voice role and reduce distributional conflict.

While recognizing the role of moderating factors, such as collective bargaining and the managerial environment, most German studies have continued to treat works councils themselves as homogeneous, capturing their direct influence via a simple dummy variable indicating the presence of a works council. The two principal exceptions to this statement are (a) the recognition of works council types and (b) the dynamic notion that works councils may learn – both of which sources of heterogeneity are hallmarks of our own treatment of works councils and plant closings. Some studies have indeed used the exact same one-time question from the 2006 wave of IAB Establishment Panel as do we, namely that inquiring about the attitude struck by the works council in respect of managerial decision making. Perhaps the best-known study is by Pfeifer (2011) who characterizes the position taken by works councils as: (1) *mostly in line with management;* (2) of *different opinion but with consensus*; and (3) of *different opinion without consensus*.[4] These are entered as dummies in cross-section productivity and profit (and wage) regressions, the reference category being absence of a works council. Pfeifer's linear regression results for productivity and wages indicate that works councils of type 2 have the highest productivity, while the estimated effect for type 3 councils is positive but statistically insignificant. The results for wages indicate that although wages in works council plants are higher across the board, they are highest in works councils of type 3. This brings us to the subjective measure of profitability. Focusing here on just the binary profit measure of at least a good profit (derived from a five-category inverse ordered scale) those establishments with works councils of types 2 and 3, especially the former, are less likely to view their profit situation as either very good or good. The adverse profit result for type 3 works councils taken to be is consistent with their high wage outcome and unimpressive productivity performance.

Pfeifer (2014) applies the same typology of works councils to investigate works council impact on a set of eight human resource management problems expected over the next two years (i.e. from 2006). In general, works council firms are less likely to report problems due to understaffing, high labor turnover, skilled worker quits, and low work motivation, and more likely to report problems of overstaffing, an aging workforce, high labor costs, and high absenteeism. As far as differences between works councils are concerned there is again evidence of works council heterogeneity: firms are found to benefit more from cooperative works councils (types 1 and 2) and have greater problems if works council-management relations are bad (type 3 situations).[5]

These studies complement an earlier empirical literature using data from the NIFA Panel – a panel survey of managers in firms in the mechanical engineering sector, 1991-1998 – that exploit a question in the 1996 wave about the attitude of the works council to technical and organizational changes as alternately 'antagonistic,' 'difficult,' 'cooperative,' 'passive,' and 'excluded.' This dataset also records additional information on the degree of involvement of the works council, to include

influence exceeding that set down by law or collective agreement. Studies by Frick (2002) and Dilger (2002) investigate the impact of works council heterogeneity, based on these attitudes (and involvement) on the use of a set of (five) high performance workplace practices, and on personnel fluctuation, flexible working time, product innovation, and profitability, respectively. The results of using this additional information on attitude are mixed in the sense that no general pattern of effects of different types of councils can be identified. For example, highest use of high performance works practices is found in plants where works councils are rated as antagonistic, and there is the suggestion that negative works council effects, where observed, can be negated by greater works council involvement.[6]

Finally, the second heterogeneity issue concerns the possibility that the relationship between the works council and plant management will change over time. Investigation of this question was prompted by the finding from the qualitative research literature that the ideological confrontation between German works councils and employers in the 1970s and 1980s had subsequently dissipated and evolved into a more cooperative relationship (see Kotthoff, 1981, 1994). *Vulgo*: antagonistic works councils may become more accommodating, or inexperienced works councils might learn, each with favorable implications for our performance indicator. This notion that the performance effects of works councils may change over time was first examined in the economics literature by Jirjahn et al. (2011), using data from a small survey of works councils (the Bonn Works Council Survey). The authors' dependent variables are fourfold: a bad relation between the two sides; a works council that is involved in decisions even where it has no legal powers (see the primer on works councils offered in the next section); the log of sales per employee; and the average quit rate in the preceding year. The key independent variable is a quadratic in works council age – on this occasion the survey providing information on the year in which the works council was introduced. Jirjahn et al. report that the probability of an adversarial relationship between the two sides declines with works council age while works council influence increases with age. For their part, the performance equations also indicate favorable effects of wage council maturation, with productivity increasing in works council age and quits decreasing in works council age (see also Mueller and Stegmaier, 2017).

In the light of the issues raised by the forgoing and the dated nature of the plant closing studies, our own treatment will focus on type of works council, potential learning effects, and the contextual/moderating factor of collective bargaining. It will consider plant closings from 2006 to 2015 using information from the leading establishment-level dataset for Germany.

3. Institutional Background

Under the enabling legislation, the 1952 Works Constitution Act (*Betriebsverfassungsgesetz)*, mandatory works councils are required to be set up in establishments with at least five employees. Mandatory does not mean automatic, however, as the formation of works councils is solely at the

initiative of the workers who have to elect these bodies. (On the details of the election of works councils as well as the subsequent amendments to the 1952 Act, see Addison, 2009). The size of the works council is fixed by law and is a function of the employment level of the establishment. Formally, the works council is independent of the unions. In practice, the majority of works councilors are union members, works councils often actively recruit union members, and unions offer guidance to councils. The employer is responsible for funding the entire costs of the works council apparatus.

The information, consultation, participation/codetermination, and veto rights of the works council are also formally prescribed by law. Information rights are extensive. The employer must provide the works council with timely and comprehensive information enabling it to discharge its general duties. These information rights increase with establishment size. Consultation rights cover such matters as planned structural alterations to and prospective changes in equipment and working methods that affect job requirements, all decisions relating to manpower planning, and individual dismissals. Failure to consult on the latter renders the dismissal in question null and void. In addition, in companies with 21 or more employees the employer is required to inform the works council on proposed alterations that may entail substantial prejudice to the staff and consult it. Indeed, the works council may *negotiate* social (compensation) plans and works agreements in these prejudicial circumstances. Codetermination rights cover "social matters." Examples include the regulation of overtime and reduced working hours, leave arrangements, and remuneration arrangements including the fixing of job and bonus rates and other forms of performance related pay. Failure to reach agreement in any of these areas leads to their adjudication through a formal conciliation apparatus. There is also a works council right of veto. In companies with 21 or more employees, the employer must notify the works council in advance of any recruitment, grading, regrading, and transfer of individuals, provide it with supportive documentation, and seek its consent. In a number of specified cases (e.g. where the staff movements would constitute a breach of an ordinance, safety regulation, or collective agreement) the works council can refuse its consent.

The German system of industrial relations consists of two parts: unions typically operate at the industry or sectoral level, and works councils represent all workers in an establishment irrespective of whether or not they are union members or their plant is covered by a collective bargaining agreement. The functions of the works council are formally distinct from those of unions. The Works Constitution Act specifically excludes works agreements on pay and other conditions of employment that are normally fixed by collective agreements *unless* the works council receives authorization to bargain. Moreover, the works council is forbidden to strike and, together with the employer, enjoined "to refrain from activities that interfere with the operations or imperil the peace in the establishment". This is the so-called *peace obligation*. Formally, then, there is a decoupling of the factors that determine the size of the enterprise surplus from the factors that determine its distribution. That being said, works councils have leveraged their codetermination rights to obtain concessions in

other areas such that the influence of works agreements that are the manifestation of their legal codetermination and bargaining rights may exceed the limits laid down by law.

This returns us to the two issues of the nature of the interface with collective bargaining and the relationship with the firm's management. Interestingly, the moderating role of collective bargaining is consistent with two different views of the works council. On the one hand, when taken in conjunction with sectoral bargaining, the German works council comes close to fulfilling Freeman and Lazear's (1995) view of an exemplary voice institution by virtue of its information, consultation, and participation rights. These powers help solve the problems attaching to the public goods nature of many working conditions and the supply of effort, allow new solutions to production and other workplace problems by virtue of the non-overlapping information sets of the two sides and the creativity of discussion, and foster cooperation by solving the commitment problem by offering workers greater security, respectively. However, as the self-same rights strengthen worker bargaining power in both formal and informal negotiations, sectoral collective bargaining is seen as permitting the separation of decisions on production from those on distribution. On this view, distributional conflicts are settled outside the establishment, allowing the parties at local level to focus on production issues. On the other hand, albeit with the same effect, unions may have an interest in policing works councils to prevent rent seeking which might undermine union power at the same time as creating greater earnings dispersion among firms (Hübler and Jirjahn, 2003: 474).

Finally, there are the practical issues raised by the ongoing trend towards decentralization in German industrial relations (see the discussion in Addison et al., 2017). For example, the introduction of collective bargaining instruments that allow the possibility of deviating from the statutory provisions of collective bargaining at plant level or making them more flexible (via opening clauses) may be expected to lead to works councils gaining in importance in matters of distribution in establishments bound by collective agreements. Also, as noted by Mueller and Stegmaier, 2020: 553), providing exceptions to industry-wide agreements could lead to works councils having to deal more intensively with distributional conflicts with implications for firm performance, including survivability. Decentralization thus acutely reinforces the narrative of Section 2 that much hinges on the relationship that works councils have with their firms' management. It also makes the point that, while instructive as regards the role of establishment size and contextual variables, the functioning of works councils cannot be divined automatically from the terms of the Works Constitution Act.

4. Modeling Strategy and Hypothesis Testing

In our modeling of establishment survival/failure we compare dissonant with non-dissonant works councils, as well as establishments having dissonant (and non-dissonant) works councils with establishments without works councils. To this end, we deploy simple pooled probit regressions (with clustered/establishment standard errors) in order to uncover the relevant correlational relationships present in the data. Specifically, using the 2006-2015 interval we run the model:

$$Pr\ (y_{it} = 1|\ X_{it}) = \Phi(X_{it}\beta), \qquad (1)$$

where y_{it} is the dichotomous dependent variable (closure) and X_{it} includes the time-invariant works council type and all the establishment-level time-constant and time-varying control variables, as well as time (year) dummies and a constant. We also implemented the random-effects panel probit model, given by $Pr\ (y_{it} = 1|\ X_{it}, u_i) = \Phi(X_{it}\beta + u_i)$, where u_i is additive in the $\Phi(.)$ function and represents the establishment's persistent unobserved traits, $\Phi(.)$ is the standard normal cumulative distribution function, and $u_i|X_{it} \sim N(0, \sigma_u^2)$. In this case, the (latent) intra-class (establishment) correlation, given by $\rho = \sigma_u^2/(1 + \sigma_u^2)$, indicates the relative importance of the unobserved effect u_i – or the correlation between any two observations in the same establishment (see, for example, Rodriguez and Elo, 2003). As the null of no presence of the unobserved effect is not rejected for our sample, however, our findings in Section 6 below will be based on the simple pooled probit model. (Results from the random effects model are available upon request.)

We assume that the quality of the dialogue between management and the works council matters. Accordingly, and in particular, we anticipate a positive association between works council dissonance and plant closings in the sample of works council establishments (*Hypothesis 1*). Whether closings are also positively associated with dissonant works council establishments in the full sample containing establishments without works councils is more debatable. However, on the assumption that dissonance thwarts the fulfilment of collective voice, any more active pursuit of rent seeking is likely to impact closings adversely. Accordingly, where establishments without a works council serve as the comparator, plant closings will likely be elevated in dissonant works council regimes (*Hypothesis 2*). It is also expected that works council dissonance in association with sectoral bargaining will be correlated with greater survivability than stand-alone dissonant works council settings (*Hypothesis 3*). This expectation will be evaluated for different samples defined by collective bargaining regime.

We also seek to analyse how learning and adjustment on the part of the works council (and indeed both parties at the workplace) evolve over time. Unfortunately, it is not possible to examine exactly how age matters in the case of dissonant works councils, the main reason being that, as discussed in section 6, the raw survey information on works council age is available only in 2012 and 2014. It is nonetheless possible to pursue the age/experience issue by constructing a rolling observation window in which works council age is necessarily increasing. More precisely, it is anticipated that, if learning occurs, there should be a decreasing magnitude of the conditional correlation between works council dissonance and closings as the window gets wider (*Hypothesis 4*).

Finally, as a supportive exercise, we revisit the potential moderating role of collective bargaining by examining bargaining transitions. Specifically, given that the interaction between a dissonant works council and coverage by a sectoral collective bargaining agreement points to increased plant survivability, the working out of the process should be accompanied by increased transitions from the state of no collective bargaining into sectoral agreement coverage (*Hypothesis 5*).

In testing hypotheses 1 through 5, we deploy a number of establishment variables in addition to detailed controls for industry (85 dummies), region/state (15), and legal form (5). It is hypothesized, in particular, that mortality rates among new firms are high for a number of reasons that include strong competition from incumbents and their dependence on costly external funding (see Fackler et al., 2013). For their part, small establishments are expected to have higher exit rates for reasons that also include lower managerial ability than their larger counterparts.

The sign of the single establishment (versus multi-establishment) control variable is more difficult to predict. As a rule, a member of a multi-establishment organization may be expected to benefit from being a part of a large organization, while yet being more exposed to intra-organization competition in bad times. For its part, foreign ownership of a given establishment is expected to work in a similar manner (i.e. indexing the pros and cons of being a part of a presumably larger (foreign) organization), although an added factor here, alluded to in the wider performance literature, may be the difficulty of establishing and sustaining cooperation between management and the works council in such establishments for cultural and information reasons. Further, an establishment with a highly qualified workforce is expected to be more adept in adjusting to cyclical fluctuations, and similarly for any unit with an updated technology. Taking participation in international markets as an indicator of higher competitive ability, export firms should be associated with lower closures, cet. par. In turn, to the extent that a higher proportion of fixed-term contract workers is associated with reduced separation costs, a rising share of such workers might signal a higher probability of establishment failure. On the other hand, a higher proportion of such workers may also be indicative of an ability to weather economic storms/downturns. The effect of a higher share of women and part-time workers, while likely to reflect other non-observables may also capture a reduced cost of closing the establishment on severance pay grounds.

At the outset, we should emphasize the (conditional) correlation nature of our regression models. While causality is undoubtedly an issue, we have attempted to capture much of the observed establishment heterogeneity using a dataset that controls for a wide array of establishment-level characteristics. The richness of the dataset in this regard is a conspicuous feature of the IAB Establishment Panel.

We have not attempted to implement an instrumental variables approach to establish causal effects as information on works council type is restricted to the 2006 Survey alone. But the question of reverse causality in particular requires further comment. Specifically, there is the issue of whether pre-existing economic conditions might induce managerial decisions that precipitate works council disaffection. In this case, unfavorable pre-existing conditions would be the ultimate cause of plant closings, and works council dissonance a reaction to the prospect of establishment closure. To address this concern we will test whether the introduction of a variable indicating the pre-existing (i.e. 2005) profit situation materially alters the coefficient estimates obtained in our baseline equation estimates reported in Table 1.

We were also concerned with the potential mechanisms through which works council dissonance might entail plant closure. In particular, we examine two possible drivers: wages and productivity. In the former case, dissonance may signal the presence of militant works councils, and any resulting elevation of wages might herald plant closure. In the latter case, dissonance might be reflected in a lack of sufficient worker commitment (and reduced worker effort), resulting in lower productivity that also endangers establishment survival. In Section 6, we shall examine whether there is any evidence favoring the presence of such mechanisms.

Note, finally, that works council status is held constant over our observation window. That is to say, the sample is made up of never works council members and always works council members. We exclude all works council joiners to reduce the risk of contamination as might occur when, for example, new councils are introduced in adverse economic circumstances where council presence might gratuitously signal a prospective failure.

5. Data

The raw information is extracted from the *IAB Establishment Panel*, which as noted earlier is a large-scale representative survey dataset of German establishments sponsored by the Institute for Employment Research (IAB) of the Federal German Labor Agency. Initiated in 1993, it comprises some 15,000 to 16,000 establishment interviews per year, with a yearly continuation response rate of over 80 percent that provides a strong panel dimension. Establishments enter the survey in every wave to both compensate for non-responses/panel mortality and also to mirror firm demography (i.e. births and deaths). For a more detailed description of the IAB Establishment Panel, the reader is referred to Fischer et al. (2009) and Ellguth et al. (2014).

For the greater part of our analysis, we shall employ an unbalanced panel covering the years 2006 through 2015, comprising establishments with at least 5 employees in the private, for-profit sector. Two key dummy variables are generated in our study: works council dissonance and plant (establishment) closure. Dissonance is based on question 85 of the 2006 IAB Survey and it is defined as equal to 1 if *management takes decisions usually against the point of view of the works council*, 0 otherwise, with the latter comprising the situations where works councils (a) adopt a *pragmatic* (solution-oriented) attitude or (b) are consensual (i.e. *management friendly*). In our framework, therefore, a dissonant works council is a separate category. The main advantage of this approach is that it offers a sharper cut-off. For its part, plant closure is our dependent variable, and is set equal to 1 if the establishment closes, 0 otherwise. The manner of its construction is next addressed.

In order to identify establishment closings, we link the IAB Establishment Panel with the Establishment History Panel (*Betriebs-Historik-Panel* or BHP) of the IAB, based on the common establishment identifier (ID). The BHP dataset comprises yearly cross-sections of all establishments in Germany that employ at least one employee subject to social security contributions as of June 30 in each year. The link between the IAB Establishment Panel and BHP allows us to apply the heuristics

provided by Hethey-Maier and Schmieder (2010; 2013) in order to identify genuine establishment closures and therefore rule out the situations of restructuring, relabeling of firms, and simple changes in the establishment identification number due, for example, to a change in ownership. Their procedure uses the largest clustered worker outflow from an exiting establishment as well as the largest clustered inflow to a new or already existing establishment to differentiate between several types of exits. According to this approach, it is possible to distinguish situations where the unique establishment ID disappears from the data due either to an artificial exit (e.g. where an establishment still exists but without having any employee liable to social security contributions) or a genuine establishment closure/death. In accordance with the proposed procedure, we classify an exiting establishment as an establishment death if the ratio of the maximum clustered outflow of workers (MCO) to employment in the year prior to the exit is up to 80 percent and the ratio of the MCO to the successor's employment (either an existing establishment or an entrant) is 80 percent at most. If the ratio of the MCO to employment of the exiting establishment exceeds 80 percent, it is labelled either "unclear," a "takeover/restructuring," or an "ID change," depending on whether the successor is an entrant or an existing establishment and on the ratio of the MCO to the successor's employment. On the other hand, if the ratio of the MCO to the successor's employment exceeds 80 percent, and the successor is an entrant, it is labeled as a "spin-off." None of these cases is classified as an establishment death in our paper.[7]

Based on various sources, the BHP also provides information on bankruptcies (Fackler et al., 2017). An alternative to flagging closures/deaths would be therefore to apply the more restrictive notion of bankruptcy. However, in matching our IAB sample with the BHP data, we only obtain 595 bankruptcies out of a total of 2,057 raw closures/deaths. Consequently, this "bankruptcy route" implies such a strong reduction in sample size as to preclude testing our main hypotheses related to works council dissonance and the corresponding interaction with sector-level collective agreement coverage.

A full description of the dependent and control variables, and the corresponding summary statistics, are provided in Appendix Table 1. One important aspect worthwhile mentioning but not reported in the table concerns the comparison across dissonant and non-dissonant councils. Based on the extended set of observables, there is no single establishment characteristic for which the difference in means – in 2006 – is statistically different from zero at the 0.01 level. At the 0.05 level the null of an equal mean is only rejected in three cases: modern technology, share of women, and establishments with 5 to 9 employees. Repeating the exercise for 2005 yielded similar results: in no case could the difference in means be rejected at the 0.01 level, while the null of no difference was again rejected at the 0.05 level in the case of the shares of women, part-time workers, and establishments with 5 to 9 employees. There is therefore no evidence that based on the set of observables dissonant and non-dissonant works councils are descriptively different.

6. Regression results

Table 1 provides an initial evaluation of the role of dissonance in plant closings. Specifically, are dissonant works councils, and hence implicitly poor workplace relations, associated with higher rates of plant closings? In the first column of the table, the default is the non-dissonant works council, and the analysis is conducted over the 2006-2015 window. By construction, all establishments are necessarily observed in 2006, and are then followed longitudinally for a varying number of years up to year 2015, so that we have 2,467 units observed on average for 4.76 years, making up a total of 11,750 establishment-year observations. In this estimation sample each establishment has a valid answer to the dissonance question (in 2006), and the mean of the dependent variable (i.e. closings) is 1.1 percent, which indicates that over the observation window we have a total of 133 closings, some 5.26 percent of which are in establishments with a dissonant works council (and where the latter constitute 3.5 percent of the establishment total).

As expected, larger and older establishments, and those with an updated technology have well-determined and negatively signed coefficient estimates, while the other control variables fail to achieve statistical significance in this particular sample. Our main variable of interest – works council dissonance – is positively associated with closings at the 0.01 level, offering confirmation of Hypothesis 1. Interestingly, the interaction between works council and sectoral agreements is negative and statistically significant at the 0.01 level, implying that sectoral coverage in the case of a dissonant council is negatively associated with closings. To give an indication of the relative magnitude of both the dissonance and the dissonance*sectoral agreement terms, we follow Buis (2010) and report in the first column of Appendix Table 2 the corresponding odds ratios. Accordingly, using a logistic model the odds ratio for dissonance is equal to 15.012, indicating that the odds of closing for a dissonant council (with no collective agreement) are approximately 15 times that for a non-dissonant council (and no collective agreement). Observe that no collective agreement is the default/omitted collective agreement regime. For the dissonant*sectoral agreement interaction term the odds ratio indicates in turn that the effect of sectoral agreement coverage for dissonant councils is now just 0.031 times that of their non-dissonant counterparts without a collective agreement. Given that the sectoral agreement term is insignificant, this means that the reduction in establishment failure is much more closely associated with sectoral agreements if there is dissonance than in the case where there is no dissonance.[8]

[Table 1 near here]

In the second column of Table 1 we enlarge the sample to encompass establishments with *and* without a works council. In this case, the number of establishment-year observations increases to 72,513, while the number of units is 19,928. The mean of the dependent variable is clearly higher than in the first column, at 2.3 percent. For their part, works council establishments are still restricted to those units surveyed in 2006 that can be followed over time, while non-works council establishments belong to any survey year within the 2006-2015 window. Two works council dummy variables are

now designated in the model – dissonant works councils and non-dissonant works councils – with non-works council status being the comparator in each case. Again, a dissonant works council is positively associated with closings, again at the 0.01 level, thereby confirming Hypothesis 2. The non-dissonant works council situation is in turn not statistically different from a regime in which there is no works council. The establishment size, age,[9] and state of technology variables display the expected signs and each is statistically significant. All the other control variables, with the exception of the share of female and part-time employees are statistically significant at conventional levels as well. The interaction between dissonant works council and sectoral agreements is negative as in the first column of the table, although on this occasion at the 0.05 level. Somewhat surprising is the positive *Non-dissonant works council*sectoral agreement* interaction term, albeit statistically significant at only the 0.10 level. We interpret the latter result as indicating that a sectoral agreement in combination with works council presence is not a sufficient guarantee against the risk of establishment failure.

An alternative is to re-run the regression in the second column of Table 1 for a restricted sample of those establishments that were interviewed in the 2006 survey, either with or without a council. The results of this exercise are given in the third column of the table. As can be seen, despite the large reduction in the number of usable observations (establishments) of approximately 41 (56) percent, the changes in the corresponding coefficient estimates and statistical significance are minor. The two exceptions are the share of skilled labor and foreign ownership variables which are now insignificant. The exercise has the advantage of precluding any possibility for a (unobserved) works council establishment in 2006 entering the panel in, say, 2010 with a non-works council status. The results show that this is little cause for concern, not least perhaps because changes in works council status are indeed very rare.

It is also noteworthy that if one ignores the distinction between dissonant and non-dissonant works councils and estimates the model in the second column of Table 1 with a dummy variable simply signifying works council presence, no statistically significant association is found; that is, the works council coefficient is not statistically different from zero at conventional levels. Dissonance is therefore a crucial aspect, with cooperative works councils ultimately being the "good" actors. This exercise also serves to show that there is certainly no general evidence that works councils push firms over the edge. A similar model for the sample of newly founded establishments (i.e. those born in the 2006-2015 interval) also produced a statistically insignificant works council coefficient. Full results of each exercise are available from the authors upon request.

The role of the interaction between works council status and the type of collective agreement can be clarified by running the model by different collective agreement regimes for separate samples of works council establishments and all establishments. Panels A through C and the two columns of Table 2 summarize the results of this experiment. Sample size is necessarily reduced as a result (cf.

Table 1), especially in the second column of panel C where the number of establishment-year observations is only 2,626.

[Table 2 near here]

Beginning with the subset of uncovered establishments in panel A, works council dissonance is associated with an increased probability of establishment closure that is significant at the 0.01 level in both the first and second columns of the table. The control variables in the first column of the table in general now show lower statistical significance. Unsurprisingly, in panel B we have the result that dissonant or antagonistic works councils are not associated with closings when they appear in combination with sectoral agreements. Indeed, in neither of the two columns of the table is the coefficient estimate of the dissonant works council variable statistically significant at conventional levels. This result confirms the findings in Table 1.

Finally, for those establishments covered by a firm-level collective agreement in panel C, we observe a significant positive relationship between closings and dissonant works councils in the first column and a non-significant relationship in the second. We shall refrain from drawing firm conclusions in this case as the estimation sample is rather small. Based on panel B, however, for which we have a sufficiently large sample, we may report support for Hypothesis 3.

The role of works council age per se in influencing plant closure is addressed in Table 3, where we seek to determine whether there is any evidence suggesting that a *dissonant* works council may evolve over time. That is, whether a bad relationship is largely a question of time (or immaturity) and is eroded by learning as a result of which both players are increasingly willing to embrace cooperation. To this end, as described in the modeling section, we exploit the panel dimension of our dataset and construct a rolling observation window, beginning with the 2006-2009 interval and extending it up to 2006-2015. In this setting, then, the age of the works council (be it dissonant or non-dissonant) will increase as the window widens. All the units in the control group are made of establishments that never had a works council.

[Table 3 near here]

As can be seen from the table, the coefficient estimate of the dissonant works council variable is always positive and highly statistically significant. This finding indicates that the hypothesized positive relationship between works council dissonance and plant closings is indeed robust across all observation periods. It is also the case that the series of positive coefficients for the dissonant works councils, with exception of the final sequence, is decreasing in magnitude with the length of the rolling window. That being said, the observed pattern scarcely offers a ringing endorsement of a learning phenomenon and hence of Hypothesis 4.[10]

Before turning to Hypothesis 5, we note that despite our effort to include in the regressions as many establishment characteristics as possible, the issues related to reverse causality are still moot. In the modeling section we briefly described the main aspects involved and we next summarize the results from our testing procedures focusing on profits and labor productivity. We first include the

pre-existing profit situation in our baseline model given in Table 1. The profit situation is modeled as a categorical variable from 1 (very good) to 5 (unsatisfactory). We report that higher profitability is associated with a lower probability of closure. However, the two estimated coefficients of major concern – the works council dissonance term and its interaction with sectoral agreements – retained their statistical significance and absolute magnitude. In short, dissonance remains a strong correlate of plant closure (see Appendix Table 3).

We next deploy information on the share of intermediate inputs and external costs in total sales to compute value added per employee as our proxy for establishment productivity level. Subject to the caveats surrounding the measure of labor productivity and the material reduction in sample size occasioned by missing information on value added, there is some evidence to suggest that works council dissonance is associated with reduced productivity in the case of firm collective bargaining. That is, the positive association between plant closings and dissonant works councils earlier reported in panel C of Table 2 is seemingly mediated by lower productivity (again see Appendix Table 3).

Finally, we also tested whether there was any evidence linking works council dissonance and higher wages. To this end, we computed an establishment's monthly (i.e. June) wage per full-time employee and ran a log wage regression on the set of firm characteristics specified in the closings model of Table 1. As expected, the firm average wage is increasing in firm size and average workforce skill level. The average wage is also higher in the presence of a collective agreement (sectoral or firm-level), while it decreases with the share of part-time, female, and fixed-term contract workers. But we found no evidence that the dissonant works council term is statistically significant in the wage regression, as was similarly the case for the corresponding interactions with type of collective agreement. Elevated wages do not therefore seem to be the mechanism through which dissonance is linked to closings. Full results of this separate exercise are available from the authors upon request.

We turn in conclusion to Hypothesis 5, which is related to the finding that the positive relationship between works council dissonance and closings is 'moderated' by collective bargaining, being much reduced where the establishment is covered by a sectoral agreement. In particular, we wish to know whether there is any evidence that, conditional on observables, firms will seek coverage under a sectoral agreement to 'manage' a dissonant works council. Specifically, we investigate whether the presence of disaffected works councils in establishments without a collective agreement encourages a higher probability of transitioning into sectoral agreement coverage.

[Table 4 near here]

Observe that in this particular extension the dataset is organized in a wholly different fashion than heretofore. We are no longer pooling establishment-level observations over a given observation window. Rather, we have a single observation per establishment, wherein we flag whether a dissonant (or otherwise) works council in 2006 is present and whether there has been any change in collective agreement status from 2006 to t_1, where t_1 is the last year in which the establishment is observed;

$t_1 \in [2007, 2015]$. Given that establishments are either not covered by any type of collective agreement or covered by a sectoral or firm-level agreement, we end up with a total of six possible scenarios. To illustrate, the first scenario (Case 1) includes all establishments that are not covered by any type of collective agreement (either sectoral or firm level) in 2006 *and* that either remain uncovered or switch to a sectoral agreement. The dependent variable is then defined as equal to 1 if there is a transition from no coverage in 2006 to sectoral agreement coverage in t_1; 0 if the establishment is not covered by any type of collective agreement in both 2006 and t_1. The second scenario (Case 2), in turn, contains all establishments that are not covered by any type of collective agreement in 2006 *and* that either remain uncovered or switch to a firm-level agreement over the observation window; the dependent variable being defined in similar fashion, namely set equal to 1 if there is a transition, 0 otherwise. And likewise for Case 3, in which establishments either switch from a sectoral agreement to no coverage *or* remain covered by a sectoral agreement, and for Case 4 containing firm-level agreement stayers *and* switchers from a firm-level agreement to no coverage. Finally, the number of transitions from a firm-level to a sectoral agreement and from a sectoral to a firm-level agreement (Cases 5 and 6, respectively) is too small to permit estimation, and these two cases are duly excluded.

Table 4 provides the full description of the relevant scenarios. As in previous experiments, we control for an extended set of establishment-level characteristics, all of which are dated at year 2006.[11] Case 1 in the first column of the table tests Hypothesis 5. It can be seen that establishments with a dissonant works council are indeed associated with the transition from no collective bargaining agreement to sectoral agreement status, a relationship that is statistically significant at the 0.05 level. We do not detect any statistical evidence linking dissonant works councils to collective bargaining transitions in the three remaining cases. Hypothesis 5 may thus be said to receive support.

7. Conclusions

The effect of workplace representation on plant closings has received little attention in the literature. As far as unions are concerned, the Anglo-American literature when reporting a negative impact of *unions* on firm performance has nevertheless found little evidence to suggest that they push firms over the edge. For their part, works councils are the hallmark of workplace representation in Germany and have increasingly been reviewed favorably in the empirical literature on firm performance. It might therefore come as something of a surprise to learn that a 2004 study using a national sample of all establishments in Germany and a 2011 study of manufacturing establishments in Lower Saxony both reported evidence of a positive association between works council presence and plant closings in the late 1990s.

As the information used in the German plant closing studies is dated, and given the availability of direct data (albeit one time and unilateral) on works council type in the most important

establishment survey for that nation, the time is ripe for a reconsideration of the works council-plant closings nexus. This justification is underscored by the findings of new studies pointing to considerable diversity in the association between works councils and other aspects of firm performance as well as the backdrop of a shift in bargaining responsibilities to the company level. The key elements of the present treatment are therefore two-fold. First of all, we exploit information contained in the 2006 IAB Establishment Panel on works council heterogeneity based on management's assessment of the attitude of the works council as cooperative or otherwise and data on plant closings covering the years 2006 through 2015. Second of all, we incorporate the role of key intervening or moderating factors suggested by an evolving works council literature.

Our main findings may be summarized as follows. First, beginning with the direct association between dissonance and plant closings for the all-establishment sample (where the reference category is absence of a works council), we find that establishments with dissonant (although not non-dissonant) councils are associated with significantly higher rates of plant closure than their works council free counterparts. Unlike the earlier literature, therefore, which used a simple works council dummy, there is no suggestion that works councils measured in this conventional way have any effect on plant closings. Second, although the sign of the direct association between sectoral agreements and plant closings is sensitive to sample construction, the sectoral bargaining-dissonant council interaction term is unambiguously negative and statistically significant throughout. Upon rerunning the model by type of collective agreement – firm agreement, sectoral agreement, and absence of agreement – the dissonant works council coefficient estimates were consistently positive and statistically significant for the last case alone and always statistically insignificant for sectoral bargaining. Third, we attempted tests of the learning hypothesis, namely that inexperienced works councils learn with age and more profoundly so (perhaps) in the case of dissonant/antagonistic works councils. The evidence was underwhelming. The most we can say that is that when we estimate the association between dissonant works councils and plant closings using a rolling window, the magnitude of the *positive* works council coefficient estimate declined in step with the observation window in six out of seven sequences. Finally, we examined collective bargaining transitions for works council establishments. Consistent with the finding that dissonant works councils are not associated with plant closings when they appear in combination with sectoral agreements, and conversely for situations in which there is no collective agreement, is the sole statistically significant transition observed in the data: compared with remaining uncovered, transitions from no coverage to sectoral bargaining coverage are very much more likely for establishments with a dissonant works council.

One obvious concern in all of this – in common with all the other studies of firm performance reviewed here that use question 85 of the 2006 IAB Establishment Panel – is that our information on works council heterogeneity is based on a single cross section of data. The potential endogeneity of the dissonant works council is not taken into account, raising the question of whether antagonistic works councils might not simply represent a reaction to pre-existing economic difficulties leading

management to make unpalatable proposals that then engender works council opposition – or for that matter signal a works council response to incompetent management whose actions are the harbinger of plant closure. Although we found no evidence of these pre-existing problems when we included the profit situation prior to 2006 in our baseline model, the issue of reverse causation remains and we cannot claim to have found a solution to the causality problem. As a result, we need to emphasize the conditional correlation nature of our results, even if the seeming selection of firms with dissonant councils into sectoral bargaining, noted above, is not suggestive of the actions of an incompetent or opportunistic management.

Some will conclude that as only a small minority of firms have dissonant works councils the major takeaway from our analysis is that the modern empirical literature pointing to a largely positive impact of works councils on firm performance does not have to be rewritten. Be that as it may, we would resist any suggestion that dissonance is not worth studying by reason of its (in)frequency. The strong correlations with plant closures/deaths uncovered here are striking and assuredly justify more study. In particular, we would contend that an improved measure of *workplace dissonance* and one that is both ongoing and bilateral (i.e. capturing the attitudes of both parties, works council and management) might be expected to throw important light on a key theme in industrial relations, namely the role of trust. This recommendation for a mutual measure of oppositional versus cooperative behavior is underscored by the growing importance of works agreements which as described by Nienhueser (2009: 373) are "an essential regulatory instrument in the contested terrain of employment relations."

Endnotes

1. For German evidence on the works council-firm performance nexus, see Addison (2009). Jirjahn (2011), and Mueller and Stegmaier (2017).

2. Even if they would draw back from the inference that unions cause the death of their host firms, Fang and Heywood (2006) in a careful study of Workplace and Employee Survey data report a robust positive association between extent of unionization and probability of closure among larger Canadian establishments 1999-2001.

3. Jirjahn primarily views the governance aspect of the voice model, underwritten by codetermination rights, as a means of preventing *employers* from engaging in opportunistic behavior, thereby facilitating long-term efficient contracting.

4. The official English translations are (1) Most business decisions are mutually agreed upon by the works council and management; (2) The works council often diverges from management's opinion when it comes to business decisions, nevertheless a consensual decision is eventually found in most cases; and (3) Business decisions have usually to be put through against the works council.

5. In a related, wider-ranging study of individual sickness absence rates and their consequences for firms, using both household data (the German Socio-Economic Panel) and linked employer-employee data (the LIAB), Arnold et al. (2018) also exploit differences in works council types, now designated as 'hostile or pragmatic' councils (i.e. types 3 and 2 combined) on the one hand and 'management friendly' councils (type 1) on the other. Anticipated personnel problems due to absence are larger for hostile and pragmatic councils but statistically insignificant for management friendly councils. These results are similar to those reported by Pfeifer (2014) whose estimates of the (separate) mean absolute marginal effects of works councils of types 2 and 3 on the probability of problems stemming from high work absence were each positive and statistically significant at the 0.01 level whereas that for type 1 was only significant at the 0.10 level.

6. For the full extended questions on works council attitude asked of the manager respondent in the NIFA-Panel in 1996, see Nienhueser (2009), who also uses the attitude/involvement data to assess the effect of this institutional heterogeneity on the frequency and quality of local work agreements. Nienhueser criticizes the above research strategy on the grounds that the questions generating the five types of councils are not mutually exclusive. Arguing that an essential criterion for good typologies is lacking, he proposes an alternative typology based on a combination of willingness to cooperate (or otherwise) and power (or lack thereof), yielding four types of works council.

7. The full classification of exiting establishments by clustered worker flows is given in Hethey-Maier and Schmieder (2010, Table 1/Panel B). An additional filter was also used in our procedures, as inspection of the data shows that it is possible that, after a seeming death, the establishment in question may still be interviewed in the IAB Establishment Panel in subsequent years. In this light, an establishment closure is flagged only if the year of death taken from the BHP either coincides with the year of the last interview of that establishment in the IAB Establishment Panel or is recorded in the year preceding that last interview. Although this procedure implies a further reduction in the number of coded deaths (of approximately 19 percent) we prefer to err on the side of caution rather than run the risk of including false deaths in our estimation sample.

8. The effects reported in Appendix Table 2 although large are to be viewed as secondary in importance. Given the cross-section nature of our data, we prefer to focus on the issue of the statistical significance of the included variables. For this reason, Tables 1 through 5 report regression coefficients (and their corresponding statistical significance), with Appendix Table 2 being provided

for illustrative purposes only. As a practical matter, the odds ratios can be approximated by the exponential of the reported coefficients.

9. Establishment age is coded as a dummy variable equal to 1 if an establishment is older than 10 years, 0 otherwise. In both columns of Table 1, replacing this single measure with two dummies (viz. between 5 and 10 years and older than 10 years, where being younger than 5 years defines the reference group) produces no material change in the estimated parameters in terms of their sign, size, or statistical significance. For older establishments we only know whether they were founded 'before 1990.' All else constant, firms younger than 5 years are indeed associated with higher probability of closure than the older firms.

10. Given that the age of the works council is actually available in raw survey information in 2012 and 2014, it is possible to construct an observation window in which we can measure the age of each works council over the period 2001-2015. (This procedure is described in Appendix Table 1.) Based on this information, we grouped works council establishments in three age categories: less than 5 years, 5 to 10 years, and more than 10 years, where the comparator is the no works council situation. The goal of the exercise was to ascertain whether, say, a 10-year old works council establishment is not only statistically different from an establishment without a works council but also from its 1 to 5-year old counterpart. None of the three works council age dummy variables was found to be statistically significant at conventional levels in our regressions. There is therefore no compelling evidence that inexperience causes younger councils to be more prone to plant closure than their older counterparts. The results of this exercise are available upon request.

11. In this case, however, as inclusion of the export and legal form dummies would imply a strong reduction in the size of the estimation sample, these controls have been dropped from the regression.

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TABLE 1
Establishment Closure, Works Council Dissonance, and Collective Agreements Coverage, Probit Estimates, 2006-2015

	Sample: Works council establishments interviewed in 2006 with a valid response to the dissonance question	Sample: All establishments (i.e. with and without a works council) (This sample includes all the establishments in the first column, plus non-works council establishments interviewed at any year between 2006 and 2015)	Sample: All establishments interviewed in 2006 (i.e. with and without a works council; all works council establishments have a valid response to the dissonance question)
Variable	Coefficient (s.e.)	Coefficient (s.e.)	Coefficient (s.e.)
Establishment size (Reference: 5-9 employees)			
10-19 employees	-0.326 (0.223)	-0.103*** (0.029)	-0.114** (0.044)
20-49 employees	-0.531** (0.214)	-0.295*** (0.033)	-0.346*** (0.052)
50-99 employees	-0.712*** (0.219)	-0.475*** (0.049)	-0.557*** (0.072)
100-249 employees	-1.086*** (0.222)	-0.586*** (0.062)	-0.707*** (0.089)
250 and more employees	-1.227*** (0.234)	-0.709*** (0.078)	-0.852*** (0.103)
Modern technology	-0.278*** (0.076)	-0.209*** (0.022)	-0.266*** (0.033)
Share of skilled workers	0.121 (0.181)	-0.167*** (0.045)	-0.077 (0.072)
Share of women	-0.058 (0.254)	0.021 (0.057)	0.009 (0.094)
Share of fixed-term contracts	0.528 (0.480)	0.253*** (0.076)	0.534*** (0.127)
Share of part-timers	0.239 (0.263)	-0.017 (0.055)	0.109 (0.089)
Foreign owned	0.034 (0.115)	0.112** (0.050)	0.116 (0.073)
Single establishment	-0.045 (0.082)	-0.079** (0.032)	-0.109** (0.048)
Establishment age	-0.335*** (0.101)	-0.304*** (0.023)	-0.296*** (0.042)
Exporter	-0.144 (0.097)	-0.067** (0.033)	-0.086* (0.049)
Works council type:			
No works council		Reference	Reference
Non-dissonant works council	Reference	-0.068 (0.083)	-0.006 (0.091)
Dissonant works council	1.140*** (0.284)	0.690*** (0.242)	0.784*** (0.247)
Collective agreement type: (Reference: no collective agreement)			
Sectoral agreement	0.120 (0.104)	-0.070** (0.029)	-0.101** (0.045)
Firm-level agreement	0.145 (0.128)	-0.038 (0.077)	-0.011 (0.112)
Interaction terms:			
Dissonant works	-1.431***	-0.751**	-0.735*

council*sectoral agreement	(0.424)	(0.379)	(0.390)
Dissonant works council*firm-level agreement	-0.689 (0.553)	-0.291 (0.475)	-0.320 (0.488)
Non-dissonant works council*sectoral agreement		0.175* (0.094)	0.237** (0.104)
Non-dissonant works council*firm-level agreement		0.090 (0.140)	0.081 (0.167)
Number of observations Number of establishments Pseudo R^2 Mean of the dependent variable	11,750 2,467 0.1660 0.011	72,513 19,928 0.0886 0.023	43,009 8,786 0.093 0.016

Notes: The dependent variable is a 1/0 dummy equal to 1 if the establishment closes, 0 otherwise. The specification also includes legal form, industry affiliation, location (*Land*), and year dummies. Clustered (establishment) standard errors are in parentheses. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.
Sources: IAB Establishment Panel, 2006-2015, and Establishment History Panel (BHP).

TABLE 2

Establishment Closure and Works Council Dissonance in Establishments without Collective Bargaining, with a Sectoral Agreement, and with a Firm-level Agreement, Probit Estimates, 2006-2015

	Sample: Works council establishments interviewed in 2006 with a valid response to the dissonance question	Sample: All establishments (i.e. with and without a works council) (This sample includes all the establishments in the first column, plus non-works council establishments interviewed at any year between 2006 and 2015)
	Coefficient (s.e.)	Coefficient (s.e.)
A. Model for establishments without collective bargaining		
Works council type:		
No works council		Reference
Non-dissonant works council	Reference	-0.098 (0.088)
Dissonant works council	1.191*** (0.460)	0.671*** (0.241)
Number of observations Number of establishments Pseudo R^2 Mean of the dependent variable	941 314 0.321 0.029	43,130 13,406 0.091 0.026
B. Model for establishments with a sectoral agreement		
Works council type:		
No works council		Reference
Non-dissonant works council	Reference	0.134* (0.073)
Dissonant works council	-0.183 (0.325)	-0.105 (0.309)
Number of observations Number of establishments Pseudo R^2 Mean of the dependent variable	6,273 1,490 0.168 0.013	24,673 7,891 0.099 0.022
C. Model for establishments with a firm-level agreement		
Works council type:		
No works council		Reference
Non-dissonant works council	Reference	0.054 (0.191)
Dissonant works council	2.952*** (.794)	0.661 (0.492)
Number of observations Number of establishments Pseudo R^2 Mean of the dependent variable	592 188 0.604 0.032	2,626 1,163 0.192 0.021

Note: The included right-hand-side variables are the same as in Table 1. See notes to Table 1.
Sources: IAB Establishment Panel, 2006-2015, and Establishment History Panel (BHP).

TABLE 3

Establishment Closure and Works Council Age using a Rolling Window, Probit Estimates

	Observation window						
Variable	2006-2009	2006-2010	2006-2011	2006-2012	2006-2013	2006-2014	2006-2015
Works council type: (Reference: no works council)							
Dissonant works council	0.821*** (0.262)	0.788*** (0.258)	0.732*** (0.255)	0.726*** (0.252)	0.700*** (0.247)	0.682** (0.245)	0.691*** (0.242)
Non-dissonant works council	0.003 (0.099)	0.035 (0.094)	-0.024 (0.093)	-0.029 (0.090)	-0.056 (0.089)	-0.081 (0.088)	-0.069 (0.084)
Collective agreement type: (Reference: no collective agreement)							
Sectoral agreement	-0.068 (0.042)	-0.079** (0.039)	-0.063* (0.037)	-0.062* (0.034)	-0.081** (0.033)	-0.077** (0.031)	-0.071** (0.029)
Firm-level agreement	-0.077 (0.100)	-0.040 (0.093)	-0.003 (0.087)	0.025 (0.082)	0.032 (0.079)	0.018 (0.076)	-0.039 (0.078)
Interaction terms:							
Dissonant works council*sectoral agreement	-0.613 (0.376)	-0.564 (0.372)	-0.679* (0.396)	-0.539 (0.362)	-0.561 (0.358)	-0.573 (0.353)	-0.751** (0.380)
Dissonant works council*firm-level agreement	-0.314 (0.514)	-0.335 (0.504)	-0.303 (0.503)	-0.294 (0.497)	-0.339 (0.481)	-0.329 (0.476)	-0.292 (0.476)
Non-dissonant works council*sectoral agreement	0.079 (0.113)	0.053 (0.108)	0.130 (0.106)	0.139 (0.103)	0.174* (0.101)	0.187* (0.099)	0.175* (0.095)
Non-dissonant works council*firm-level agreement	0.029 (0.177)	0.001 (0.164)	-0.137 (0.166)	-0.089 (0.154)	-0.048 (0.150)	0.004 (0.145)	0.091 (0.141)
Number of observations Number of establishments Pseudo R^2 Mean of the dependent variable	30,725 12,539 0.098 0.026	37,621 13,691 0.095 0.025	44,602 14,766 0.096 0.024	51,551 16,054 0.094 0.024	58,831 17,412 0.096 0.024	65,688 18,605 0.093 0.023	72,513 19,928 0.089 0.023

Notes: The specification includes establishment size, legal form, export status, industry affiliation, location (*Land*), and year dummies, as well as the set of establishment-level characteristics. Clustered (establishment) standard errors are in parentheses. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.
Sources: IAB Establishment Panel, 2006-2015, and Establishment History Panel (BHP).

TABLE 4

Collective Bargaining Transitions and Works Council Dissonance, Probit Estimates for Establishments with a Works Council, 2006-2015

Variable	CASE 1 The dependent variable is equal to 1 if there is a transition from *No CB* coverage in 2006 to *Scb* coverage in t_1; 0 if the establishment is not covered by *CB* in both 2006 and t_1.	CASE 2 The dependent variable is equal to 1 if there is a transition from *No CB* coverage in 2006 to *Fcb* coverage in t_1; 0 if the establishment is not covered by *CB* in both 2006 and t_1.	CASE 3 The dependent variable is equal to 1 if there is a transition from *Scb* coverage in 2006 to *No CB* coverage in t_1; 0 if the establishment is covered by *Scb* in both 2006 and t_1.	CASE 4 The dependent variable is equal to 1 if there is a transition from *Fcb* coverage in 2006 to *No CB* coverage in t_1; 0 if the establishment is covered by *Fcb* in both 2006 and t_1.
Works council type: (Reference: non-dissonant works council)				
Dissonant works council	+0.601** (0.257)	+0.230 (0.204)	-0.00340 (0.113)	+0.124 (0.288)
Number of observations (establishments) Pseudo R^2	483 0.296	445 0.169	1,659 0.157	292 0.194

Notes: By construction all establishments have a works council in 2006 and works council status is fixed over the 2006-2015 interval. 2006 is the first year in which an establishment is observed, and t_1 is the last, with $t_1 \in [2007, 2015]$. The set of included regressors is the same as in Table 1, except in the case of industry affiliation which now comprises 17 industries. Sample size is too small in the case of transitions from *Fcb* coverage in 2006 to *Scb* coverage in t_1(Case 5) and similarly for transitions from *Scb* to *Fcb* coverage (Case 6). These two cases are therefore omitted from the table. *No CB*, *Scb*, and *Fcb* denote no collective bargaining agreement, sectoral agreement, and firm-level agreement coverage, respectively. Standard errors are given in parentheses. ** denotes statistical significance at the 0.05 level.

Source: IAB Establishment Panel, 2006-2015.

APPENDIX TABLE 1

Variable Definition and Summary Statistics

Variable	Definition	Mean (s.d.)
The dependent variable:		
Establishment closure	1/0 dummy: 1 if an establishment exits the administrative records gathered in the Establishment History Panel (BHP) of the IAB. An establishment closure is only identified as such if the year of death taken from the BHP either coincides with the year of the last interview of that establishment in the IAB Establishment Panel or is recorded in the year preceding that last interview. See text for a description of the procedure.	0.023 (0.151)
The explanatory variables:		
Works council	1/0 dummy: 1 if a works council is present	0.179 (0.383)
Sectoral agreement	1/0 dummy: 1 if the establishment is bound by an industry-wide sectoral wage agreement	0.352 (0.478)
Firm-level agreement	1/0 dummy: 1 if the establishment is bound by a company-level wage agreement	0.053 (0.223)
Establishment age	1/0 dummy: 1 if establishment is older than 10 years	0.775 (0.417)
Exporter	1/0 dummy: 1 if establishment sells in foreign countries	0.274 (0.446)
Establishment size:		
5-9 employees	1/0 dummy: 1 if establishment has 5 to 9 employees	0.267 (0.442)
10-19 employees	1/0 dummy: 1 if establishment has 10 to 19 employees	0.195 (0.397)
20-49 employees	1/0 dummy: 1 if establishment has 20 to 49 employees	0.238 (0.426)
50-99 employees	1/0 dummy: 1 if establishment has 50 to 99 employees	0.118 (0.323)
100-249 employees	1/0 dummy: 1 if establishment has 100 to 249 employees	0.099 (0.298)
250 and more employees	1/0 dummy: 1 if establishment has 250 or more employees	0.083 (0.276)
Single establishment	1/0 dummy: 1 if establishment belongs to a single establishment firm	0.785 (0.411)
Legal form:		
Individually-owned firm	1/0 dummy: 1 if establishment belongs to an individually-owned firm	0.257 (0.437)
Limited/general partnership	1/0 dummy: 1 if establishment belongs to a limited/general partnership	0.061 (0.240)
Limited liability company	1/0 dummy: 1 if establishment belongs to limited liability company	0.619 (0.486)
Company limited by shares	1/0 dummy: 1 if establishment belongs to company limited by shares	0.031 (0.173)
Public company	1/0 dummy: 1 if establishment is publicly owned	0.008 (0.087)
Other legal form	1/0 dummy: 1 if establishment has other legal form	0.023 (0.151)
Foreign owned	1/0 dummy: 1 if establishment is mainly or exclusively owned by a foreign entity	0.056 (0.230)
Modern technology	1/0 dummy: 1 if the overall technical state of the plant, machinery, and equipment of the establishment is updated, compared with other establishments in the same industry (1 or 2 in the 1 to 5 technology Likert scale)	0.688 (0.463)

Share of women	Share of female employees	0.389 (0.291)
Share of skilled workers	Share of employees hired for complex tasks that require either a vocational training certificate, a corresponding measure of professional experience, or a university or college degree	0.689 (0.259)
Share of part-timers	Share of part-time employees	0.218 (0.244)
Share of fixed-term contracts	Share of employees with a fixed-term contract	0.051 (0.126)
Variable specific to the 2006 IAB Survey: (for establishments with a works council) (N=11,750)		
Dissonant works council	1/0 dummy: 1 if management takes decisions usually against the point of view of works council.	0.028 (0.165)
Variables specific to the 2011-2015 window:	Assignment of the works council age is based on questions 75b and 79b of the 2012 and 2014 IAB Surveys, respectively. Based on the 2012 survey we assign the works council age in years 2011 through 2015; in case there is no information available from the 2012 survey, the information from the 2014 survey serves to allocate the age of the works council for those years.	
Works council age_1	1/0 dummy: 1 if the works council age is less than 5 years	0.021 (0.144)
Works council age_2	1/0 dummy: 1 if the works council age is 5 to 10 years	0.024 (0.154)
Works council age_3	1/0 dummy: 1 if the works council age is more than 10 years	0.206 (0.404)

Notes: With exception of two variables, works council dissonance and works council age at the foot of the table, the reported means refer to the estimation sample in the second column of Table 1 (N = 72,513 establishment-year observations). The sample comprises all establishments with at least 5 employees in the private, for-profit sector, grouped in 86 separate industries, located in the 16 federal states (*Länder*).
Sources: IAB Establishment Panel, 2006-2015, and Establishment History Panel (BHP).

APPENDIX TABLE 2
Establishment Closure, Works Council Dissonance, and Collective Agreements Coverage, Odds Ratios Based on Logit Estimates, 2006-2015

	Sample: Works council establishments interviewed in 2006 with a valid response to the dissonance question	Sample: All establishments (i.e. with and without a works council) (This sample includes all the establishments in the first column, plus non-works council establishments interviewed at any year between 2006 and 2015)
Variable	Odds ratio (s.e.)	Odds ratio (s.e.)
Establishment size (Reference: 5-9 employees)		
10-19 employees	0.524 (0.267)	0.801*** (0.054)
20-49 employees	0.335** (0.166)	0.506*** (0.041)
50-99 employees	0.208*** (0.106)	0.321*** (0.039)
100-249 employees	0.085*** (0.045)	0.242*** (0.039)
250 and more employees	0.057*** (0.033)	0.176*** (0.037)
Modern technology	0.510*** (0.105)	0.625*** (0.033)
Share of skilled workers	1.406 (0.659)	0.693*** (0.072)
Share of women	0.820 (0.559)	1.031 (0.135)
Share of fixed-term contracts	3.609 (4.445)	1.731*** (0.293)
Share of part-timers	1.869 (1.297)	0.964 (0.122)
Foreign owned	1.133 (0.361)	1.295** (0.149)
Single establishment	0.893 (0.204)	0.834** (0.063)
Establishment age	0.476*** (0.125)	0.508*** (0.028)
Exporter	0.717 (0.190)	0.849** (0.069)
Works council type:		
No works council		Reference
Non-dissonant works council	Reference	0.830 (0.186)
Dissonant works council	15.012*** (9.858)	5.634*** (2.988)
Collective agreement type: (Reference: no collective agreement)		
Sectoral agreement	1.311 (0.362)	0.855** (0.058)

Firm-level agreement	1.422 (0.493)	0.881 (0.161)
Interaction terms:		
Dissonant works council*sectoral agreement	0.031*** (0.033)	0.138** (0.128)
Dissonant works council*firm-level agreement	0.153 (0.233)	0.482 (0.564)
Non-dissonant works council*sectoral agreement		1.547* (0.389)
Non-dissonant works council*firm-level agreement		1.303 (0.472)
Number of observations Number of establishments Pseudo R^2 Mean of the dependent variable	11,750 2,467 0.1627 0.011	72,513 19,928 0.0886 0.023

Notes: See notes to Table 1.
Sources: IAB Establishment Panel, 2006-2015, and Establishment History Panel (BHP).

APPENDIX TABLE 3
Establishment Closure Controlling for the Pre-Existing Profit Situation and a Digression on the Determinants of Establishment Productivity Level

Variable	Model	
	Establishment closure (1)	Establishment productivity level (2)
	Coefficient (s.e.)	Coefficient (s.e.)
Establishment size (Reference: 5-9 employees)		
10-19 employees	-0.335 0.225	0.687*** 0.210
20-49 employees	-0.567*** 0.216	1.310*** 0.202
50-99 employees	-0.744*** 0.221	1.959*** 0.201
100-249 employees	-1.115*** 0.224	2.740*** 0.200
250 and more employees	-1.256*** 0.240	3.999*** 0.202
Modern technology	-0.181** 0.079	0.149*** 0.032
Share of skilled workers	0.114 0.188	.448*** .091
Share of women	-0.052 0.266	-0.051 0.140
Share of fixed-term contracts	0.696 0.475	-0.253 0.207
Share of part-timers	0.103 0.270	-0.703*** 0.148
Foreign owned	0.022 0.117	0.043 0.063
Single establishment	-0.065 0.085	-0.199*** 0.038
Establishment age	-0.377*** 0.102	0.003 0.060
Exporter	-0.127 0.101	0.226*** 0.049
Profit situation in 2005 (Reference: Unsatisfactory)		—
Very good	-0.557*** 0.121	—
Good	-0.565*** 0.105	—
Satisfactory	-0.826*** 0.111	—
Sufficient	-1.078*** 0.216	—
Works council type:		
Non-dissonant works council	Reference	Reference
Dissonant works council	1.100*** 0.290	-0.015 0.164

Collective agreement type: (Reference: no collective agreement)		
Sectoral agreement	0.131 0.107	0.252*** 0.046
Firm-level agreement	0.117 0.131	0.144*** 0.049
Interaction terms:		
Dissonant works council*sectoral agreement	-1.503*** 0.432	-0.109 0.203
Dissonant works council*firm-level agreement	-0.853 0.558	-0.627** 0.314
Number of observations Number of establishments R^2 Pseudo R^2	11,604 2,438 — 0.21	8,214 1,900 0.70 —

Notes: Column (1) reports the results from including four profit situation dummies in the baseline probit model presented in Table 1, denoted as *Very good, Good, Satisfatory, and Sufficient (Unsatisfactory* is the reference category). Column (2) gives the results of a firm-level log productivity linear regression on the same set of firm characteristics (excluding the profit situation). In both columns the sample comprises works council establishments interviewed in 2006 with a valid response to the dissonance question. Clustered (establishment) standard errors are in parentheses. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.
Sources: IAB Establishment Panel, 2006-2015, and Establishment History Panel (BHP).